ICS ADVENT

7408/7415 Series Chassis Manual

MANUAL NUMBER : 00431-085-24A

CE

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Mission Critical Applied Computing Solutions

Notice of Non-Compliance with CE 2001

As of January 1, 2001 the following additional CE requirements apply to any units placed on the market in the European Union:

- EN 61000-3-2:1995 Electromagnetic Compatibility (EMC) Harmonic emissions on equipment with input current to 16A
- EN 61000-3-3:1995 Electromagnetic Compatibility (EMC) Voltage Flicker on equipment with input current to 16A

ICS Advent does not claim compliance to the two aforementioned standards.

ICS Advent does not authorize that this unit be placed on the market in the European Union beyond December 31, 2000.

Any claims of CE compliance in the product manual(s) provided shall be considered void as of January 1, 2001.

This product is no longer CE compliant as of January 1, 2001.

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Revision History

Date	Revision	Description of Change
03/00	24A	New bracket option added to allow internal installation of two 3.5-inch disk drives. Models come standard with bracket that holds only one drive. Changed the installation instructions in Chapter 4.
11/99	23A	Chapter 1 - Removed the obsoleted 250W and four-output power supply chassis models listed. Added the new 300W, five-output power supply chassis model to list. Backplanes are now ordered separately from chassis, so the chassis model numbers have been updated as follows:

New	*Old*
7408(B)-A3	7408-23V, 7408-33V
7408(B)-D3	7408(B)23V-D4
7408T(B)-A3	7408T(B)33V, 7408T(B)23V
7415(B)-A3	7415P(B)23V-B3, 7415P4(B)23V-B3, 7415P6(B)23V-B3, 7415K(B)23V-B3, and 7415K6(B)23V-B3
7415(B)-A4	7415P(B)23V-B4, 7415P4(B)23V-B4, 7415P6(B)23V-B4, 7415K(B)23V-B4, and 7415K6(B)23V-B4
7415(B)-D3	7415(B)23V-D4, 7415P(B)23V-D4, 7415P4(B)23V-D4, and 7415P6(B)23V-D4

Replaced Appendix A drawings with new drawings.

FOREWORD

This product manual provides information to install, operate and/or program the referenced product(s) manufactured or distributed by ICS Advent. The following pages contain information regarding the warranty and repair policies.

Check our Web site (***http://www.icsadvent.com/techsupport***) for technical information, manual, and BIOS updates. Technical assistance is also available at: **800-480-0044** (U.S. and Canada) or **858-677-0877** (international).

Manual errors, omissions, bugs, and/or comments: A Customer Comments section is included at the end of this manual. If you experience any problems with the manual or just want to give us some feedback, please review the information in this section. It will tell you how to easily access our web site and provide immediate feedback online.

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Guarantee

A thirty day money-back guarantee is provided on all standard products sold. **Special order products** are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement only. Extended Warranty available. Consult factory.*

Refunds

In order to receive refund on a product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in as-new and resalable condition. The **Return Procedure** must be followed to assure prompt refund.

Restocking Charges

Product returned *after* 30 days, and *before* 90 days, of the purchase will be subject to a **minimum** 20% restocking charge and any charges for damaged or missing parts.

Products not returned within 90 days of purchase, or products which are not in as-new and re-saleable condition, are not eligible for credit return and will be returned to the customer.

Limited Warranty

Effective April 1, 1998, all products carry a two-year limited warranty with the exception of the "Performance Series" I/O products, which are warranted to the original purchaser for as long as they own the product, subject to all other conditions below, including those regarding neglect, misuse and acts of God. Within two years of purchase, ICS Advent will repair or replace, at our option, any defective product. At any time after two years, we will repair or replace, at our option, any defective "Performance Series" I/O product sold. This does not include products damaged in shipment, or damaged through customer neglect or misuse. ICS Advent will service the warranty for all standard catalog products for the first two years from the date of shipment. After the second year, for products not manufactured by ICS Advent, the remainder of the manufacturer's warranty, if any, will be serviced by the manufacturer directly.

The **Return Procedure** must be followed to assure repair or replacement. ICS Advent will normally return your replacement or repaired item via Second Day Air. *Overnight delivery or delivery via other carriers is available at additional charge.*

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than ICS Advent or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of ICS Advent or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the owners' manual.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. ICS Advent reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by ICS Advent.

Return Procedure

For any Limited Warranty or Guarantee return, please contact ICS Advent's Customer Service at **800-480-0044** and obtain a Return Material Authorization (RMA) Number. All product(s) returned to ICS Advent for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing date of purchase.

> To reduce risk of damage, returns of product must be in an ICS Advent shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from ICS Advent Customer Service at a nominal cost.

Limitation of Liability

In no event shall ICS Advent be liable for any defect in hardware or software or loss or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. ICS Advent liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by ICS Advent or its authorized agent.

Some *Sales Items* and *Customized Systems* are **not** subject to the guarantee and limited warranty. However in these instances , any deviations will be disclosed prior to sales and noted in the original invoice. ***ICS Advent reserves the right to refuse returns or credits on software or special order items.***

Advisories

Three types of advisories are used throughout the manual to stress important points or warn of potential hazards to the user or the system. They are the Note, the Caution, and the Warning. Following is an example of each type of advisory:

Note: The note is used to present information which may provide special instruction or extra information which may help to simplify the use of the product.

CAUTION!

A Caution is used to alert you of a situation which if ignored may cause injury or damage equipment.

WARNING!

A Warning is used to alert you of a situation which if ignored will cause serious injury.

Cautions and Warnings are accented with triangular symbols. The excalmation symbol in all cautions and warnings alerts you to the important instructions. The lightning flash symbol on the left hand side of a caution or a warning notifies you that the advisory relates to voltage that may be of sufficient magnitude to cause electrical shock.

Use caution when servicing any electrical component. We have tried to identify the areas that may pose a caution or warning condition in this manual; however, ICS Advent does not claim to have covered all situations that might require the use of a Caution or Warning.

You must refer to the documentation for any component you install into a computer system to ensure proper precautions and procedures are followed.

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Current Revision 24A

March 2000

Chapter 1: Introduction

This manual describes the 7408 and 7415 Series chassis. A complete list of products covered by this manual appears at the end of this chapter.

Chapter 1 provides an overview of the product line. Chapter 2 describes components, including specifications and dimensional drawings. Chapter 3 describes circuit boards, excluding the backplane or motherboard. Chapter 4 provides installation instructions. Chapter 5 contains maintenance and troubleshooting information. An appendix at the end of the manual provides schematics and wiring diagrams.

General

The 7408/7415 Series computer chassis meet or exceed typical needs for industrial applications. They are rack-mounted chassis, constructed of 18 gauge, gold zinc plated, cold rolled steel. The efficient design permits effortless upgrades of onboard components.

The front panel controls and indicators are clearly visible behind a locking Lexan panel. User controls include the system power switch, system reset switch, speaker volume adjustment (non-ATX models), and the front keyboard connector. In addition, the front panel contains indicators for disk drive access and power supply outputs.

The rear panel conforms to CE compliance with a seal that reduces RFI and EMI emissions. The rear panel also has a keyboard connector, knockouts for many standard connectors, and access to all expansion slots.

Slot 1 Technology

Slot 1 technology is the latest in processor support. ICS Advent offers a custom designed backplane that has incorporated this technology. When you purchase a chassis with a Slot 1 backplane, you must also purchase a custom *feature card set.* This feature card set consists of a custom *feature card*, a *Voltage Regulator Module (VRM)*, and a *Pentium II, Pentium III, or Celeron CPU*. When you order a chassis with a Slot 1 backplane, you will receive a feature card manual, a Slot 1 backplane manual, and a chassis manual.

Motherboards or Backplanes

The 7408/7415 Series chassis accommodate Baby AT or ATX motherboards or 15-slot backplanes. The backplanes accept plug-in CPU boards that install just like any other adapter card. Backplane components include sockets for adapter cards, LED circuitry, and ICS Advent's Bus Power Check for each power supply output. Backplanes are available in ISA and ISA/PCI bus architectures. For more information about backplanes, refer to the *ISA Backplanes Manual* (part number 00431-101), the *ISA/PCI Backplanes Manual* (part number 00431-020), or the *Slot 1 Backplanes Manual* (part number 00431-242).

Note: If you purchased a system with a Slot 1 backplane, your chassis will arrive with the feature card already installed in the backplane.

Power Options

The 7408/7415 Series chassis offer several power supply options. Depending on your system, you may choose a 300W or 400W power supply (see page 2-2). The power supplies have switch-selectable inputs for 115VAC or 230VAC. For more information about your power supply option, refer to the *Power Options Manual* (part number 00431-240).

Disk Drives

The 7408/7415 Series chassis accept up to two half-height 5.25-inch drives and one low-profile 3.5-inch front-mounted drive. The 5.25-inch drive bays may be used in a number of configurations, including, with the use of an adapter, any 3.5-inch device. The front-mounted drives are secured from unauthorized access by the locking front panel. One or two additional 3.5-inch devices may be mounted internally. All disk drives are protected against vibration and shock.

The drive cage on these chassis allow easy access for removal and installation as described in Chapter 4.

Chassis Cooling Fans

A 106CFM front-mounted fan pressurizes and filters the air inside the chassis. You may also purchase a second 106CFM fan for the card cage area. These fans ensure a positive internal pressure that prevents airborne contaminants from entering the chassis and, in particular, from entering the area surrounding the disk drives.

Global Interference Reduction System

As processor and bus speeds increase, RF becomes more difficult to contain within today's systems. Processor speeds in industrial computers already are passing 1GHz, with bus speeds at 100MHz and climbing. The Global Interference Reduction System (GIRSystem®) reduces EMI emission and static discharge sensitivity problems associated with modern, ultrahigh-speed computer systems.

The GIRSystem incorporates many design features previously used in high-end workstations rather than personal computers. RFI gasketing seals the top, tighter weldments guarantee integrity, grounded front panel access doors protect disk media, and extra precautions during assembly reduce leakage paths.

Additionally, the GIRSystem employs an RFI *leakproof* design for mounting adapter cards. The original XT card mounting bracket has never been altered, nor have there been significant changes in grounding brackets. However, as processor speeds increased, so has RFI leakage, especially between the mounting bracket and the chassis. The GIRSystem includes a gasketed bracket guide that seals this gap without interfering with the use of standard PC adapter cards. The bracket guide provides a full-length RFI seal on every adapter card installed, without the need for special adapter cards or modifications to your normal adapter cards.

The GIRSystem in your chassis successfully satisfies the 89/336/EEC directive for CE marking now required in Europe. These requirements are even more stringent than FCC Class A specifications both for emissions and susceptibility.

Models Covered by this Manual

Note: Except where indicated, chassis are designed for rack mounting.

The following models accommodate a standard Baby AT motherboard:

7408-D3 – Gray chassis with 300W, 48VDC main power input
7408B-D3 – Black chassis with 300W, 48VDC main power input
7408-A3 – Gray chassis with 300W, 115/230VAC, five output power supply
7408B-A3 – Black chassis with 300W, 115/230VAC, five output power supply

The following models accommodate an ATX motherboard:

7408T-A3 – Gray chassis with 300W, 115/230VAC, PS/2 ATX style power supply
7408TB-A3 – Black chassis with 300W, 115/230VAC, PS/2 ATX style power supply
7408T-A2R - Gray chassis with redundant 250W, 115/230VAC, PS/2 ATX style power supply
7408TB-A2R - Black chassis with redundant 250W, 115/230VAC, PS/2 ATX style power supply

The following models accommodate a 15-slot ISA or PCI backplane:

7415-D3 – Gray chassis with 300W, 48VDC main power input
7415B-D3 – Black chassis with 300W, 48VDC main power input

The following models accommodate a 15-slot ISA, PCI, or KALAMATH backplane:

7415-A3 – Gray chassis with 300W, 115/230VAC, five output power supply
7415B-A3 – Black chassis with 300W, 115/230VAC, five output power supply
7415-A4 – Gray chassis with 400W, 115/230VAC, five output power supply
7415B-A4 – Black chassis with 400W, 115/230VAC, five output power supply

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Chapter 2: Specifications

This chapter contains specifications and dimensional drawings for products in the 7408 and 7415 Series chassis. (Chapter 1 contains a complete list of products covered in this manual.)

Specifications

Note: Specifications are for the backplane, power options, monitor, and chassis. Your feature cards may alter the maximum specifications. Operating altitude, temperature and power supply loading are interactive and affect the actual specifications according to application. Chassis modifications and different paint colors are available on request. Consult ICS Advent for a quotation to meet your needs.

Backplanes

For more information on the backplanes, please refer to the *ISA Backplanes Manual* (part number 00431-101), the *ISA/PCI Backplanes Manual* (part number 00431-020), or the *Slot 1 Backplanes Manual* (part number 00431-242).

Motherboards

The 7408 models accept Baby AT, full-size AT, and ATX motherboards.

Power Options

Several power options are available for your chassis. Refer to the *Power Options Manual* (part number 00431-240) for specifications on your power supply.

4-710095 - 300W, five output

4-710078 - 400W, five output

4-700053 - 300W, 48VDC

4-710077 - 300W, PS/2 ATX style

Chassis Cooling Fans

One 106CFM fan filtered at 45ppi is located in the fan enclosure. A second 106CFM fan is optional.

Fan Intake Filter

- Dimensions (L x W x D): 7.7 x 5.5 x .375in (196 x 140 x 9.5mm)
- 45ppi, open cell polyfoam, SIF 'Z'
- ICS Advent part number 40891-01B

Controls, Indicators, and Connectors

Keyboard Connector Locations

- Front panel, behind locking front access door
- Rear panel

To use the front panel keyboard connector with motherboard systems (7408), you need an adapter cable to bypass the rear-panel connector. This cable is included with your purchase of a 7408 chassis.

Front Panel Indicators

- Disk activity LED
- Power supply status LEDs

Front Panel Controls

- Power on/off
- System reset
- Speaker volume adjust (on non-ATX models, only)

Rear Panel Controls/Connectors

- Input voltage selection switch (115/230V) on AC models only
- Power on/off switch for DC models

Note: For normal operation of DC models, leave the power supply on/off switch in the "on" position. Turn system power on and off with the computer power switch.

- AC or DC input power connection
- Chassis knockouts for DB-9 and DB-25 shell connectors on motherboard models

Chassis Details

Mounting

- Rack (7408/7415)

Disk Drive Capacity

In the Drive Cage (front-accessible mount):

- One 3.5-inch drive
- One full-height or two half-height 5.25-inch drives

In the Fan Enclosure (internal mount):

- One 3.5-inch drive, on standard single bracket, or
- Two 3.5-inch drives, on optional double bracket

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Dimensions (W x H x D)

- 17 x 20 x 7in (432 x 508 x 178mm)
- 19in wide at front panel (483mm)

Weight

- 35 to 45 lbs (15.90 to 20.45kg)

Finish

- Chassis–Gold zinc plated
- Front Panel–Painted gray or black

Paint Color

- Cardinal Paint, #8103-44705, gray, medium texture, water based
- Cardinal Paint, #8102-08, black, medium texture, water based

Operating Environment

Temperature

- 10 to 50 °C

Humidity

- 8 to 90% RHNC

Storage Environment

Temperature

- -40 to 60 °C

Humidity

- 8 to 90% RHNC

Agency Approvals

- FCC Conformity with:
  47 CFR Part 15, Subpart B, Class A
- CE Conformity with:
  EU EMC Directive 89/336/EEC
  EU Low Voltage Directive 72/23/EEC
- UL/cUL Recognized to:
  UL 1950, 2nd Ed: 1993
  cUL/CAN/CSA-C22.2 No. 950-93

Dimensional Drawings

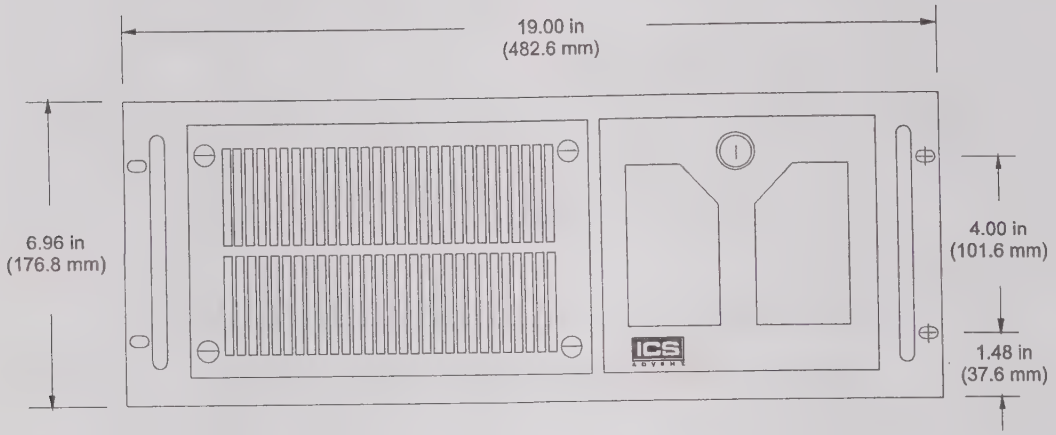

Figure 2-1: 7415, Front View (Rack Mount)

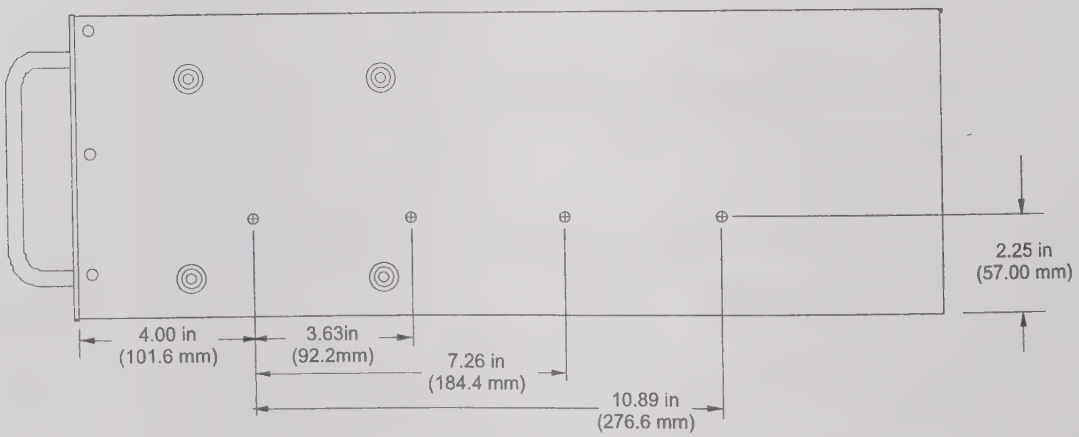

Figure 2-2: 7415, Side View

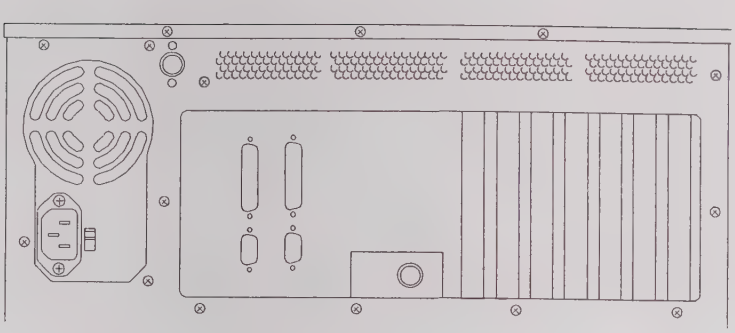

Figure 2-3: 7408, Rear View AT-Motherboard Chassis

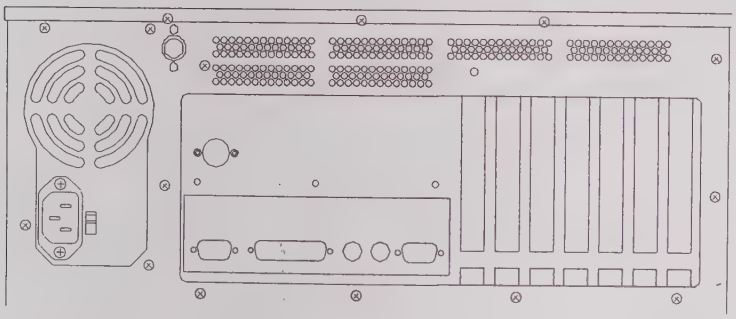

Figure 2-4: 7408T, Rear View ATX-Motherboard Chassis

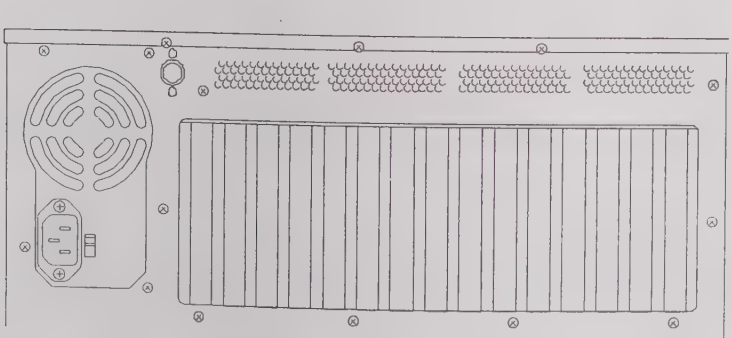

Figure 2-5: 7415, Rear View Backplane Chassis

Figure 2-6: 7415, Top View Cover Removed

Figure 2-7: 7415 Top Assembly

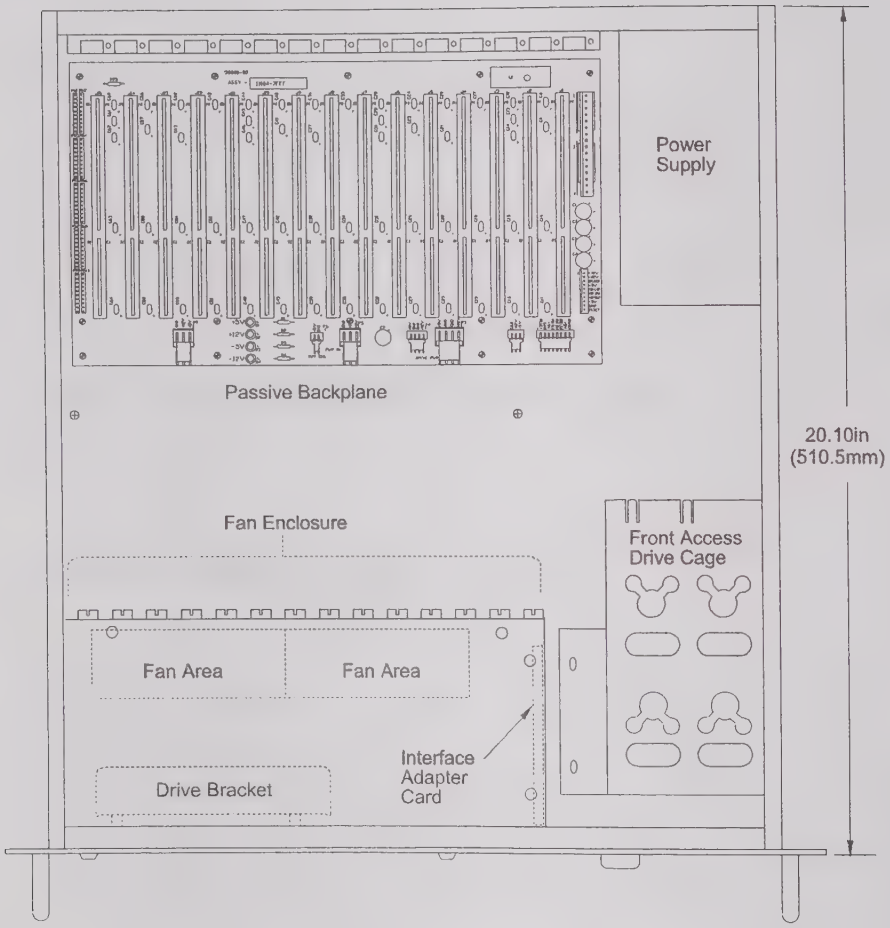

Figure 2-6: 7415, Top View Cover Removed

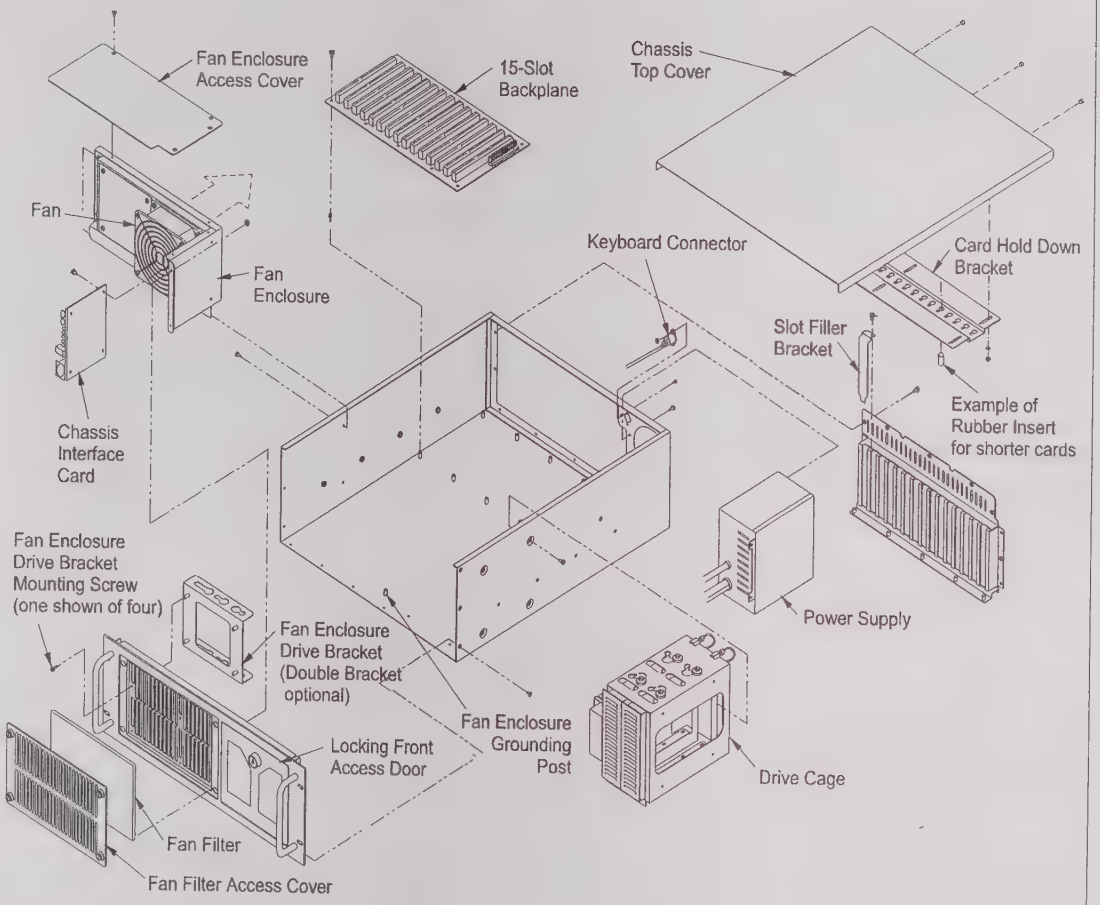

Figure 2-7: 7415 Top Assembly

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Chapter 3: Circuit Boards

This chapter describes the circuit boards installed in standard 7408 and 7415 chassis except the motherboard or backplane. Depending on your choice of backplane, please refer to the *ISA Backplanes Manual* (part number 00431-101), the *ISA/PCI Backplanes* manual (part number 00431-020), or the *Slot 1 Backplanes Manual* (part number 00431-242).

For information on chassis wiring, please refer to the diagrams in the Appendix.

Interface Adapter Card

The only card installed as a standard feature in 7408/7415 models is the interface adapter card, shown in **Figure 3-1**. This card connects the chassis speaker, reset button, keyboard connectors, and disk access LED signals from the CPU to the appropriate chassis components. The interface adapter card is connected to the backplane or motherboard by a harnessed cable. Refer to the backplane manual (included with your system purchase) or to the documentation for your motherboard for pin connections.

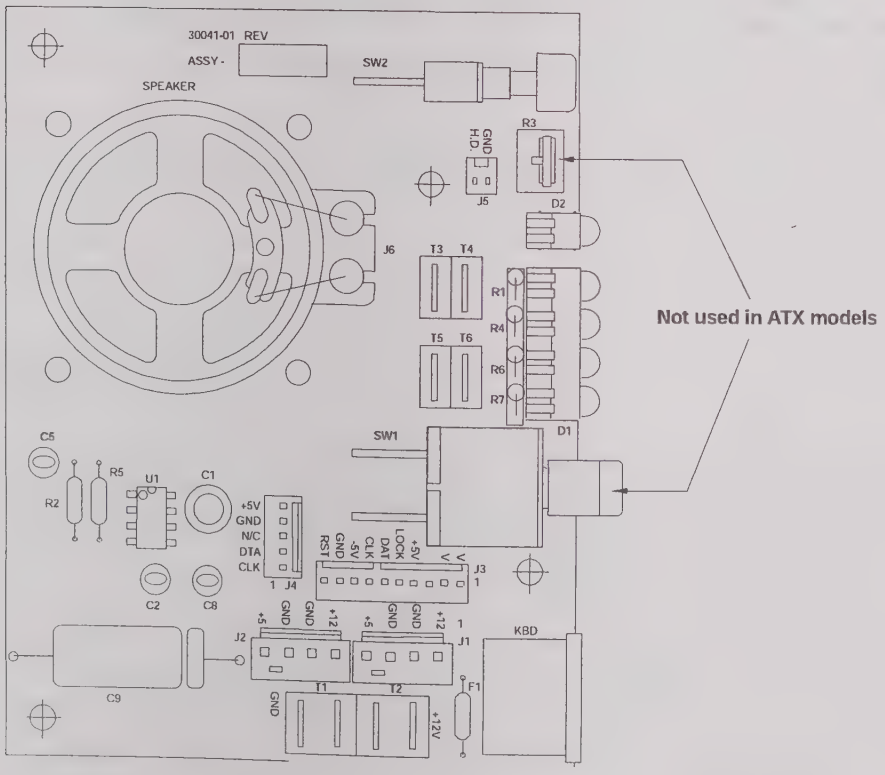

Figure 3-1: Interface Adapter Card Assembly Drawing

Disk Drive Access LED

The disk drive access LED gives a visual indication of the system hard drive use (**Figure 3-2**).

Power Supply LEDs

The power supply LEDs provide a visual check of +5V, +12V, -5V, and -12V coming from the power source (**Figure 3-2**). If the LED is lit, the equivalent voltage is present, but this does not confirm that the voltage is within specified tolerances.

Speaker Gain

The 7415 model comes standard with a speaker mounted on the IAC. Adjustments are made with a potentiometer accessed through a small opening on the front panel of the chassis.

Note: There is no speaker gain adjustment on the 7408 model.

System Reset

The system reset switch is also located on the IAC and is accessible through the front panel. Press the switch through the opening shown in **Figure 3-2** to reset the system.

Note: The front panel access door has been removed in **Figure 3-2** to show the controls and indicators.

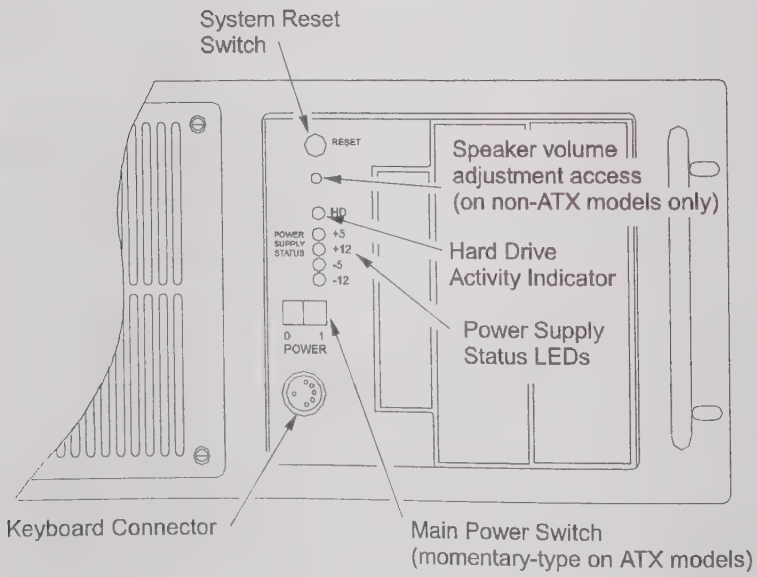

Figure 3-2: Front Panel Indicators and Controls

Chapter 4: Installation

Your 7408/7415 Series chassis will be shipped with most of the components installed and tested. This chapter describes how to mount the chassis in your equipment rack, how to install a motherboard or CPU card, and how to install disk media.

Rack Mounting

The 7408 and 7415 chassis are rack-mount units. ICS Advent recommends equipment slide rails with ball bearings to support the chassis and permit easy access for maintenance and troubleshooting. For racks 18 to 24 inches deep, use Model 7501-RMK18 slide rails, and for racks 24 to 30 inches deep, use Model 7501-RMK. The mounting holes on the chassis front panel are set to standard 19in RETMA spacing and will fit into any standard equipment rack with 7in of available vertical space.

After installing the slide rails, place the chassis on the rails and secure it into the rack using four retaining screws.

CAUTION!

The 7408/7415 Series chassis weigh between 35–45 lbs (15.89–20.43kg). To prevent the equipment rack from toppling when the chassis is extended, **secure the rack to the wall or floor.**

Slot 1 Backplane Systems

If you ordered a system with a Slot 1 backplane, your chassis will be shipped with all components installed and tested. Refer to the *Slot 1 Backplanes Manual* (part number 00431-242) and the *P2LX Feature Card Manual* (part number 00431-232) or the *P2BX Feature Card Manual* (part number 00431-244).

Power

Use a certified power cord for the country in which the 7408/7415 Series chassis will be operated.

CAUTION!

If the power cord is damaged or is not suitable for the country of use, replace it with a 3-conductor, 18AWG (0.75mm^2 cross sectional area) cord, certified to the local electrical codes.

Installation of Motherboard

If you ordered a chassis with a motherboard, the system will be tested for you before shipment. If you ordered an AT or ATX chassis but did not order the motherboard, the chassis will include an installation kit. The kit contains plastic and metal standoffs used to mount the motherboard to the chassis floor. Metal standoffs provide proper grounding. Refer to your motherboard instructions for proper grounding locations and installation procedures.

A loopback cable allows you to use a front keyboard connector. The loopback cable is connected to the motherboard's keyboard connector and to the rear keyboard connector on the chassis. This arrangement uses the rear keyboard connector as an input, allowing the signals to be routed through the interface adapter card to the front keyboard connector (**Figure 4-1**). If you don't need the front keyboard connector, don't install the loopback cable.

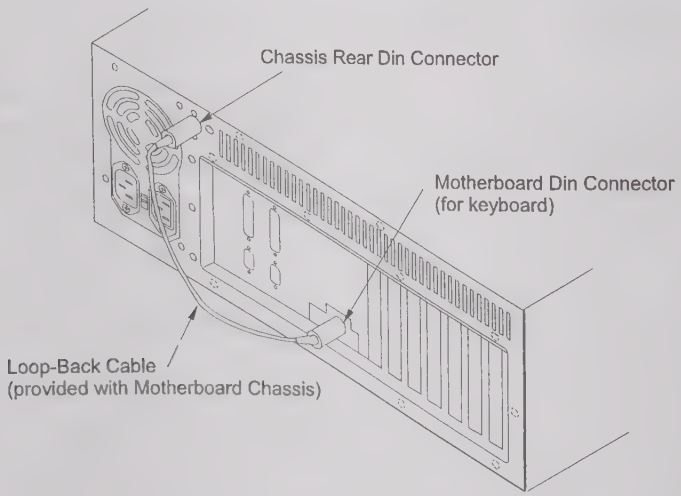

Figure 4-1: Loopback Cable Connection

Installation of CPU (excluding Slot 1 backplanes)

Installing a plug-in CPU card requires inserting the card into the backplane and connecting the appropriate connectors. The CPU card installs into the backplane just like any other feature card. Align the CPU card with a slot and firmly press down. Do not force the board. If it does not slide into place, check the alignment and try again. Make sure the card bracket is flat against the rear panel and slides straight down to ensure proper fit. The bracket will be seated between the retaining bracket and the EMI gasket when correctly installed (**Figure 4-2**).

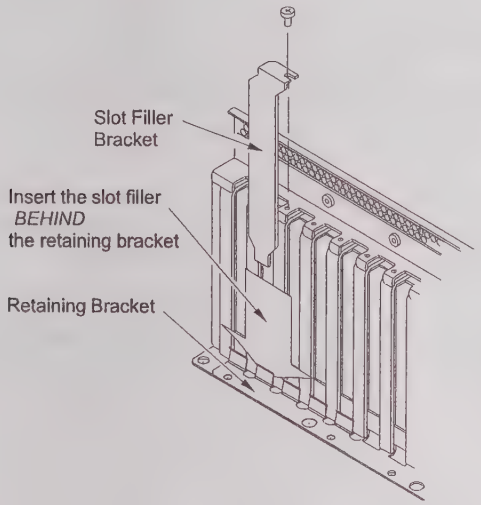

Figure 4-2: Seating the Slot Filler Bracket

The backplane is connected to J3 of the interface adapter card to supply the system reset, keyboard, and speaker signals. Connect a cable from J5 of the interface adapter card to the CPU hard drive indicator output. Refer to the wiring diagram in the appendix for more information.

Note: Your chassis may require a load on the power supply to function. ICS Advent offers an optional ISA plug-in power supply load board that provides the minimum loading requirements.

Installation of Disk Drives

Disk drives may be mounted in two locations in the chassis: in the drive cage and in the fan enclosure (Refer to **Figure 2-7**). The drive cage accepts one 3.5-inch drive and either two half-height 5.25-inch drives or one full-height 5.25-inch drive, with access behind the locking front door. The fan enclosure can hold one 3.5-inch drive using the standard single drive bracket or two 3.5-inch drives using an optional double bracket, Part No. 7415-HD. Drives mounted in the fan enclosure are not accessible from the front.

If you purchased your disk drives with your chassis, the drives will be installed and tested for you prior to shipment. If you purchased your drives separately or purchased additional drives as an add-on, follow the instructions below to mount a drive in the drive cage or in the fan enclosure.

WARNING!

Ensure that system power is off and the unit is disconnected from its power source. Failure to do so could cause serious injury or damage equipment.

Installation in Drive Cage

The steps below describe how to install up to three devices in the drive cage: one full-height or two half-height 5.25in devices and one 3.5in device.

1. Remove the top cover of the chassis by loosening the three screws on the top cover. Slide the cover back approximately one inch and lift up. Use caution when sliding the top cover to prevent damaging the gasket.
2. Remove the drive cage from the system chassis by removing the four drive cage mounting screws located on the drive side of the chassis (**Figure 4-3**). If necessary, remove connectors from existing drive(s) to allow easy access. Lift the drive cage out of the chassis.

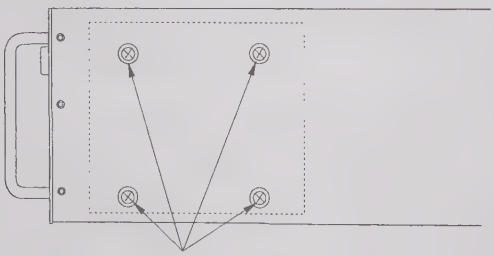

Figure 4-3: Drive Cage Mounting Screws

3. To install an optional 3.5-inch device in the drive bay, install the device in the drive cage filler bracket (**Figure 4-4**).

Note: Select a position for your drive(s) that will not interfere with the door latch of the chassis and that will permit easy insertion/removal of your disk media.

4. To install 5.25-inch drives, first install the shock mount rubber grommet in the drive cage. The front access drive cage has two available positions. Select the position that best suits your configuration and allows the access door to close. Place the drive(s) in the drive cage and attach with four screws (**Figure 4-4**). Be sure to use the proper thread (SAE or Metric) and length screws for your drive(s). Using a screw that is too long may damage your drive electronics, your CPU, or both.

5. Attach a power connector to the drive(s). The power connector is keyed and can only be inserted in the correct direction. Shock mounted drives need an additional cable connected between the drive and a grounding tab, located on the drive cage, to provide the necessary ground for EMI protection.

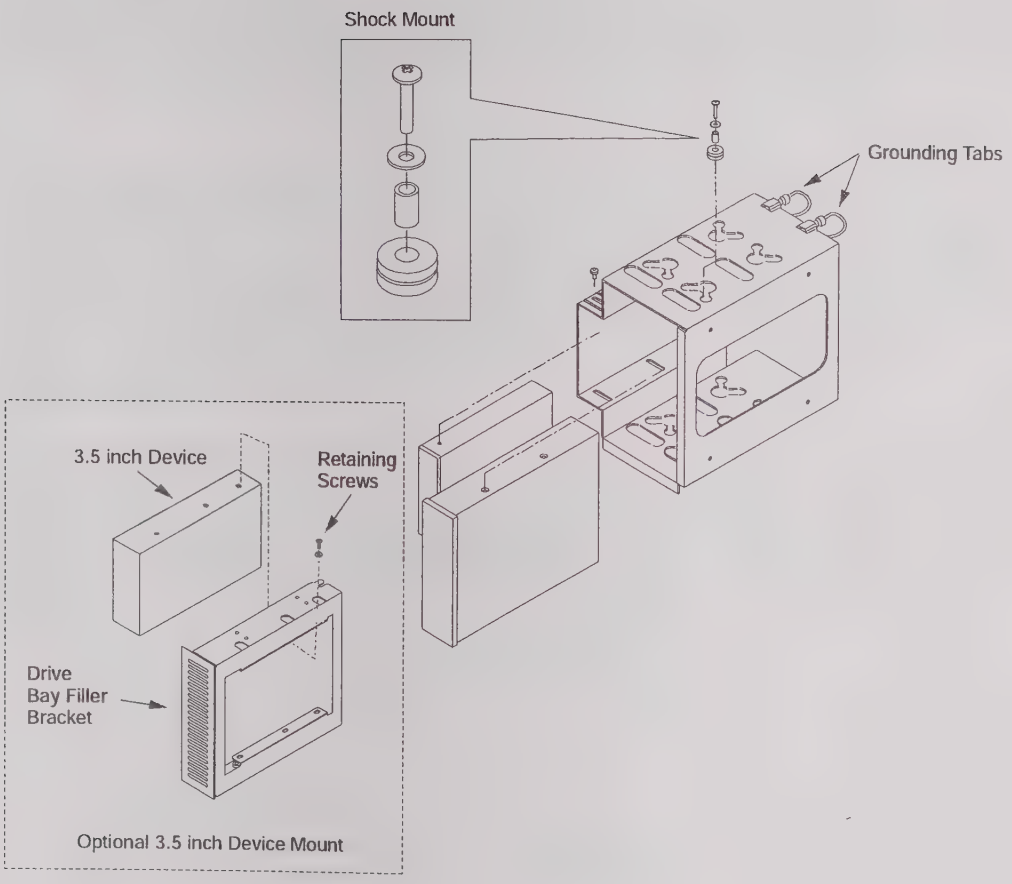

Figure 4-4: Drive Cage Disk Drive Installation

6. Attach the hard disk or floppy disk cables between the appropriate connectors on the drive(s) and the drive controller. IDE fixed disk drives and diskette drives each require one cable for up to two devices.
7. If necessary, re-attach the grounding strap to the grounding tab.
8. Secure the drive cage into position with the four mounting screws.
9. Reinstall the top cover of the chassis.
10. Update your system BIOS to include the new device(s). Refer to your CPU manual for more information.

Installation in Fan Enclosure

Installation is the same for either the standard single or the optional double drive bracket.

1. Remove the top cover of the chassis by loosening the three screws on the top cover of the chassis. Slide the cover back approximately one inch and lift up. Use caution when sliding the top cover to prevent damaging the gasket.
2. Remove the fan enclosure access cover (**Figure 2-7**).
3. Remove the fan filter access cover and the filter.
4. Remove the fan enclosure drive bracket by removing the four mounting screws on the front of the chassis (**Figure 4-5**). If necessary, remove connectors from the existing drive to allow easy access. Lift the drive bracket out of the chassis.
5. Install the rubber grommet(s) in the bracket for shock mounting. Place the drive(s) in the bracket and attach with four screws. Be sure to use the proper thread (SAE or Metric) and length screws for your drive(s). Using a screw that is too long may damage your drive electronics, your CPU, or both.

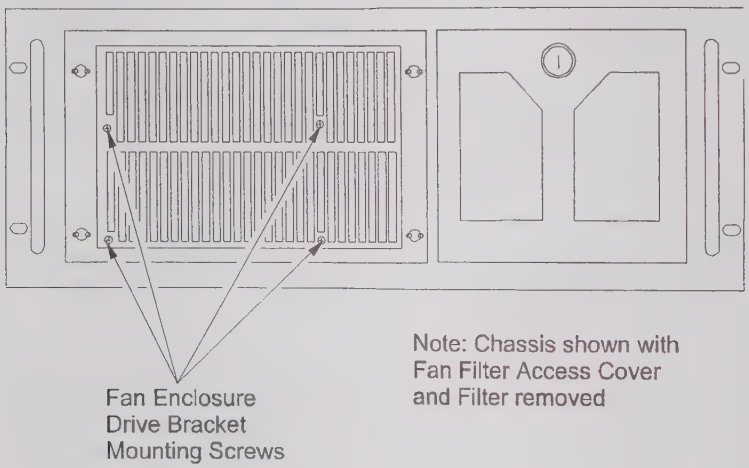

Figure 4-5: Fan Enclosure Drive Bracket Mounting Screws

6. Attach a power connector to the drive(s). The power connector is keyed and can only be inserted in the correct orientation.
7. Thread the drive cable into the fan enclosure by passing it through the gap under the interface adapter card. IDE fixed disk drives require one cable for up to two drives. Attach the hard disk cable between the appropriate connectors on the drive and the drive controller you have purchased.
8. Attach the grounding jumper wire (provided in your shipping kit) to the drive grounding tab and to the fan enclosure grounding post (located on the floor of the chassis next to the interface adapter card).
9. Secure the drive bracket back into position with the four mounting screws.
10. Reinstall the filter and the fan filter access cover.
11. Reinstall the top cover of the chassis.
12. Update your system BIOS to include the new device(s). Refer to your CPU manual for more information.

Front Panel Keyboard Connection

The keyboard may be connected into the front panel keyboard connector (**Figure 3-2**), labeled "KBD" on the interface adapter card. This connector is simultaneously active with the rear panel keyboard connector, except on motherboard models that require the loopback cable, described earlier in this chapter and illustrated in **Figure 4-1**.

Card Cage

The rear area of the chassis contains the motherboard or backplane and is generally referred to as the card cage. The card cage provides the necessary mounting hardware typically needed for installing and securing XT- and AT-sized feature cards. Unused expansion slots are filled by slot filler brackets (**Figure 4-2**). A card hold-down bracket is provided to keep feature cards seated.

Card Hold-down Bracket

The card hold-down bracket is mounted inside the card cage area and attached to the chassis top panel (**Figure 2-7**). It secures feature cards installed in a passive backplane or motherboard. The bracket is adjustable to provide maximum flexibility with the CPU and other feature cards that require ribbon cables to be routed over them. The bracket also accepts rubber inserts to support shorter cards. To adjust the bracket, loosen the four screws securing the bracket and slide it to the desired position.

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Chapter 5: Maintenance and Troubleshooting

This chapter describes limited maintenance and troubleshooting procedures for your 7408/7415 Series chassis. If you would like assistance with these procedures, please contact our Technical Support staff at **800-480-0044**.

FCC Compliance Statement for Class A Devices

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be non-compliant with the appropriate standards for its intended use.

How to Remain CE Compliant

For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques. Although ICS Advent offers accessories, the customer must ensure that these products are installed with proper shielding to maintain CE compliance. ICS Advent does not offer engineering services for designing cabling systems. In addition, ICS Advent will not retest or recertify systems or components that have been reconfigured by customers.

Air Filter

Industrial Computer Source provides a filter to remove most large dust particles that enter the chassis. This filter should be cleaned as often as necessary to prevent overheating due to reduced air movement. The filter can be blown out or washed in soapy water. Remove the filter from the chassis before cleaning and ensure it is dry before reinstalling.

To remove the filter, release the four spring-loaded retaining screws on the front of the chassis that secure the filter cover plate in place. Once the cover plate is removed, the filter can easily be removed and cleaned.

In particularly dirty environments, a filter enhancement spray may be used to improve dirt retention. These sprays are available from a variety of sources. High efficiency filter material is also available and can be cut to shape. Be careful not to reduce the cooling airflow with various filter media to the point where chassis overheating becomes a problem.

Note: Filters do not remove fumes or gases. Do not use the chassis in environments where airborne contaminants may damage the system.

For the most part, dust poses no danger to a computer except for disk drives. The exception is dust that is conductive such as metal or carbon particles. For particularly dirty environments, floppy drive lifetimes will be significantly reduced. For such environments, consider solid state "disks" such as the Industrial Computer Source EPROM, SRAM or FLASH disk emulators or hard disks. Solid state PCMCIA/JEIDA data cards can be used in place of floppy diskettes for portability. Networks can also be used in dirty environments to replace floppy drives.

Troubleshooting

The components of a computer are all interrelated. That is, a "video" problem may be caused by the disk controller. The simplest diagnostic technique involves replacing the suspect card with a new one. If that doesn't fix the problem, remove all cards except for the minimum required by the system. Then run the system, replacing each card until the problem shows itself.

Note: Troubleshooting a chassis may require a load on the power supply. Industrial Computer Source offers an optional ISA plug-in power supply load board that provides the minimum loading requirements of 0.96A load on +12VDC and 4A load on +5VDC. Please mention Model 10273-01B when ordering.

Slot 1 Backplane Systems

If you purchased a system with a Slot 1 backplane, please refer to the troubleshooting sections in the *P2LX Feature Card Manual* (part number 00431-232), the *P2BX Feature Card Manual* (part number 00431-244), and the *Slot 1 Backplanes Manual* (part number 00431-242).

WARNING!

The following procedures involve working with high voltage. Contact with this voltage can seriously injure you. Accidental shorting of the circuits can damage the computer.

CAUTION!

The following procedures involve working with a device that is sensitive to static electricity. Use proper precautions to protect against electrostatic discharge (ESD).Only qualified personnel should attempt these procedures.

Unit doesn't power up when switched on.

A) Check front panel switch.

B) Check that the power cord is completely plugged in and power is available at the source.

C) Check the LEDs on front panel and on the backplane. If they are flickering there is insufficient load on the power supply.

D) Check if the power supply cables in the chassis have been crimped or pinched. In the case of a short, the power supply will sense the short and shut off. It will also automatically sense the removal of the short and restore operation.

Note: The power supply will not operate if not minimally loaded. Be sure a CPU or load card is installed to load the supply, otherwise the supply will appear to be faulty.

Power supply LED on front panel doesn't light.

A) The LED may be faulty. Check the LEDs on the backplane. If they are lit, the LED on the front panel is most likely faulty. Otherwise, ensure that the proper voltage is being supplied to the LED.

B) The power supply may be shorted or the supply wires may be open. The power supply "chirps" if the +5V output is shorted. Check the I/O connectors on the backplane to be sure they are not shorted with a piece of solder or wire and are not damaged. If chirping is not evident, the problem is probably an open circuit in the supply wiring.

Note: There is no user service access to the power supply; it is a sealed unit. If the seal on the power supply is broken, the warranty is void.

C) If the backplane LEDs do not show voltage present, test for voltage at the power supply connector using a multimeter (see Chapter 3). If voltage is not present then check the connector for correct pin placement, open connections, bad wire crimps, etc.

Note: Be careful when probing the connectors. Do not short across the connector pins because damage will occur if the supply pins are shorted to a signal pin. This damage is not covered by warranty. Do not bend the pin in the connector with your probe tip.

System gets power, but computer doesn't run. No disk activity or beeps.

A) Check backplane LEDs for power. Remove all cards except CPU and video card. Turn on system, watch for picture and listen for beeps. If no activity, remove video card, turn on system, listen for beeps. If no beeps, replace CPU or test CPU in another chassis. If beeps heard, replace video card.

B) If picture comes up from A) above, replace each card one at a time. Faulty card will prevent system from booting.

Systems beeps, but no picture.

A) Be sure monitor power is connected and monitor is properly connected to the computer.

B) Check switches on video card. If correct, replace video card.

C) Strip the system down by removing cards until the defective card is identified.

Optional fan(s) do not operate after installation.

A) Ensure the wires are connected properly to the IAC. If polarity is reversed, fans will not operate.

B) Visually inspect the fan wires to ensure they are not damaged.

Returns

If you need to return a product to Industrial Computer Source for any reason, the following applies:

First, call Customer Service for a Return Materials Authorization (RMA) number. The RMA number must be visible on the outside of the box in which you pack the product for return shipment. Shipments without an RMA number will not be accepted by Customer Service Receiving.

When shipping the product to Industrial Computer Source, the product must be properly packed:

- Remove any protruding keys, light pens, keyboards, cables, etc.
- Insert a shipping protector in 5.25in devices.
- Secure all plug-in cards with screws. Screw down the lid. Be sure the drive cage is tightened and that access doors are closed.
- Put the product in a bag to prevent moisture and dirt from entering the drive and card areas.
- Provide adequate packaging and use standard electrostatic discharge (ESD) precautions. If possible, use the original box and packing material.
- Chassis weigh about 40 pounds (18.2kg). A minimum of four inches of proper packing material is required around all sides. Double-thick cardboard is preferred. **Do not use styrofoam peanuts or loose fill to pack.** Assume the box will be dropped several feet during shipping.
- Do not ship by motor freight. Use a carrier such as Burlington, Airborne, or Federal Express.

Appendix A: Schematic and Wiring Diagrams

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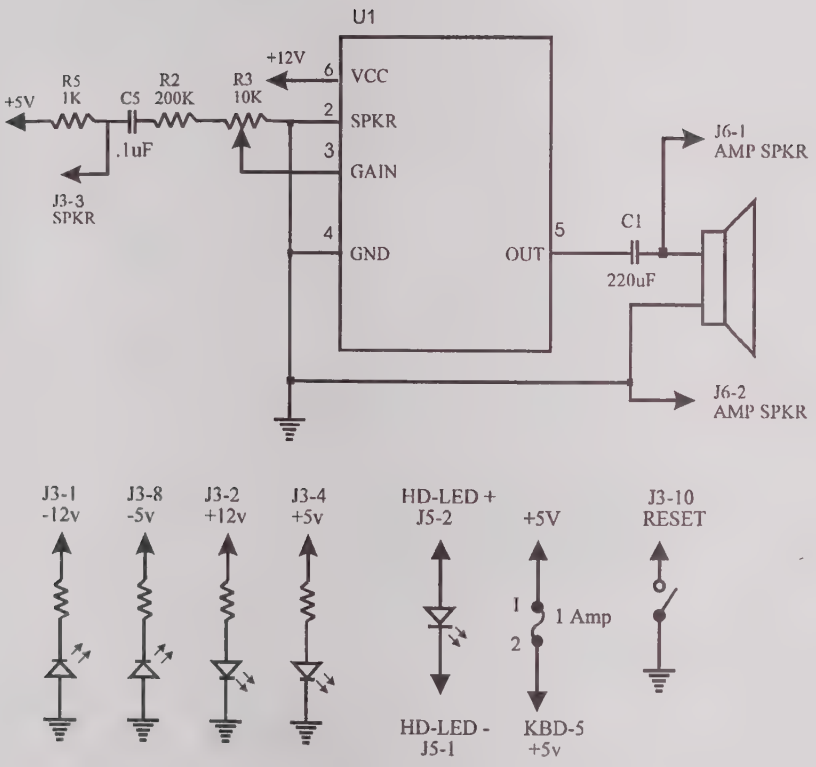

Figure A-1: Interface Adapter Card PCA Schematic

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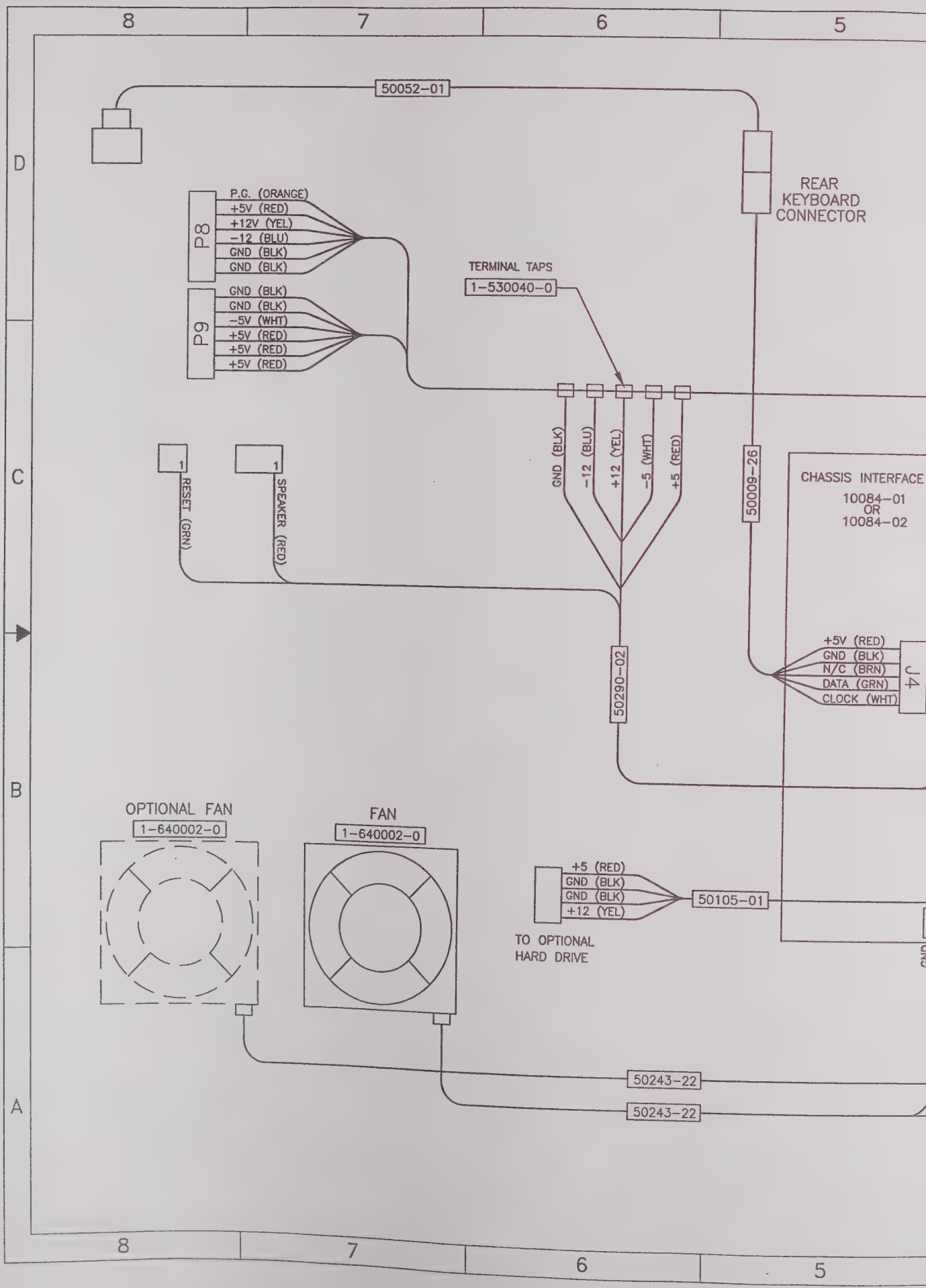
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D
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KEYBOARD
CONNECTOR
P8
P.G. (ORANGE)
+5V (RED)
+12V (YEL)
-12 (BLU)
GND (BLK)
GND (BLK)
P9
GND (BLK)
GND (BLK)
-5V (WHT)
+5V (RED)
+5V (RED)
+5V (RED)
TERMINAL TAPS
1-530040-0
GND (BLK)
-12 (BLU)
+12 (YEL)
-5 (WHT)
+5 (RED)
50009-26
CHASSIS INTERFACE
10084-01
OR
10084-02
1
RESET (GRN)
1
SPEAKER (RED)
50290-02
+5V (RED)
GND (BLK)
N/C (BRN)
DATA (GRN)
CLOCK (WHT)
J4
OPTIONAL FAN
1-640002-0
FAN
1-640002-0
+5 (RED)
GND (BLK)
GND (BLK)
+12 (YEL)
50105-01
TO OPTIONAL
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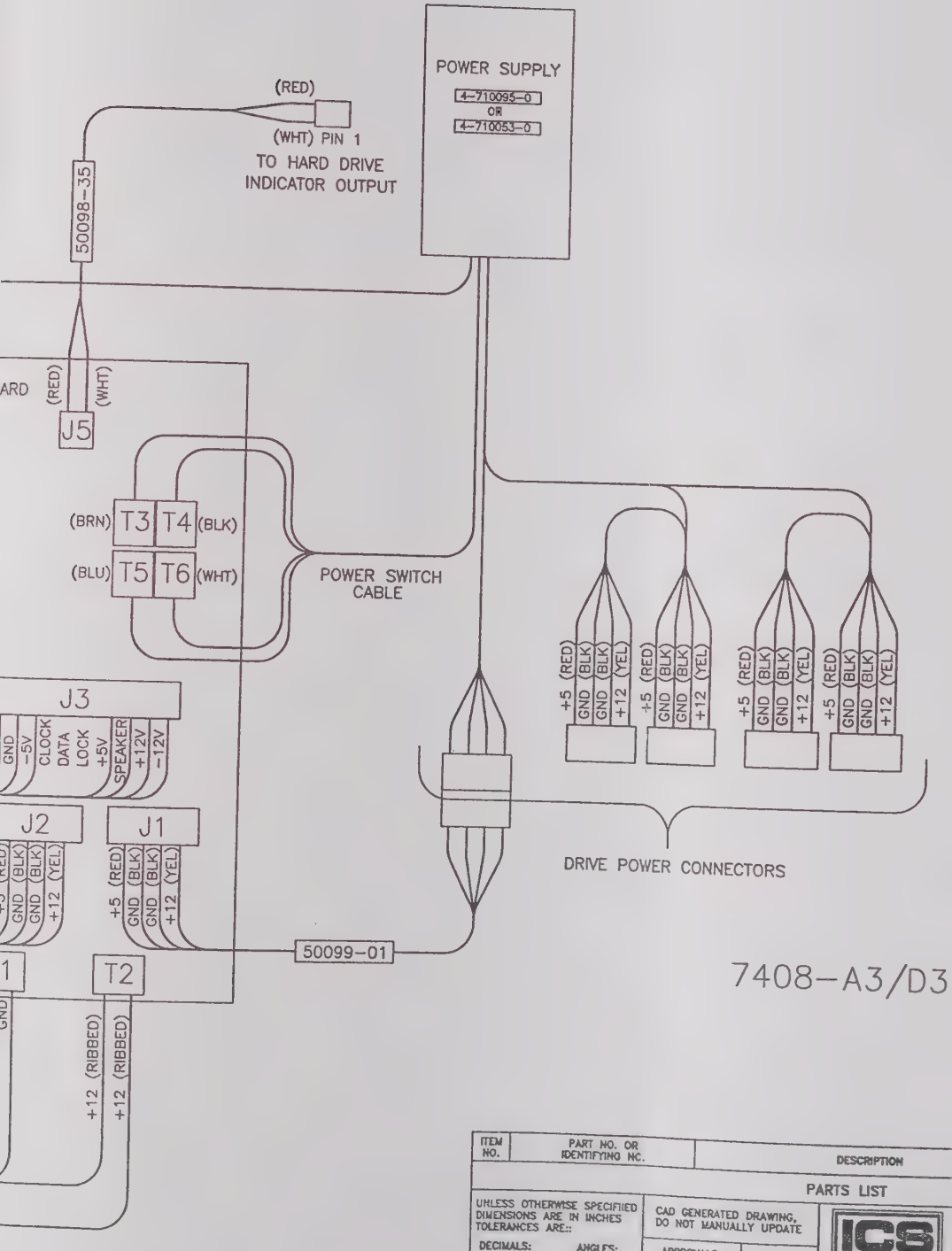

7408-A3/D3

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MFG ENG	
QUAL ENG	

ICS ADVENT — Mission Critical Applied Computing Solutions

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7408(T)-D3

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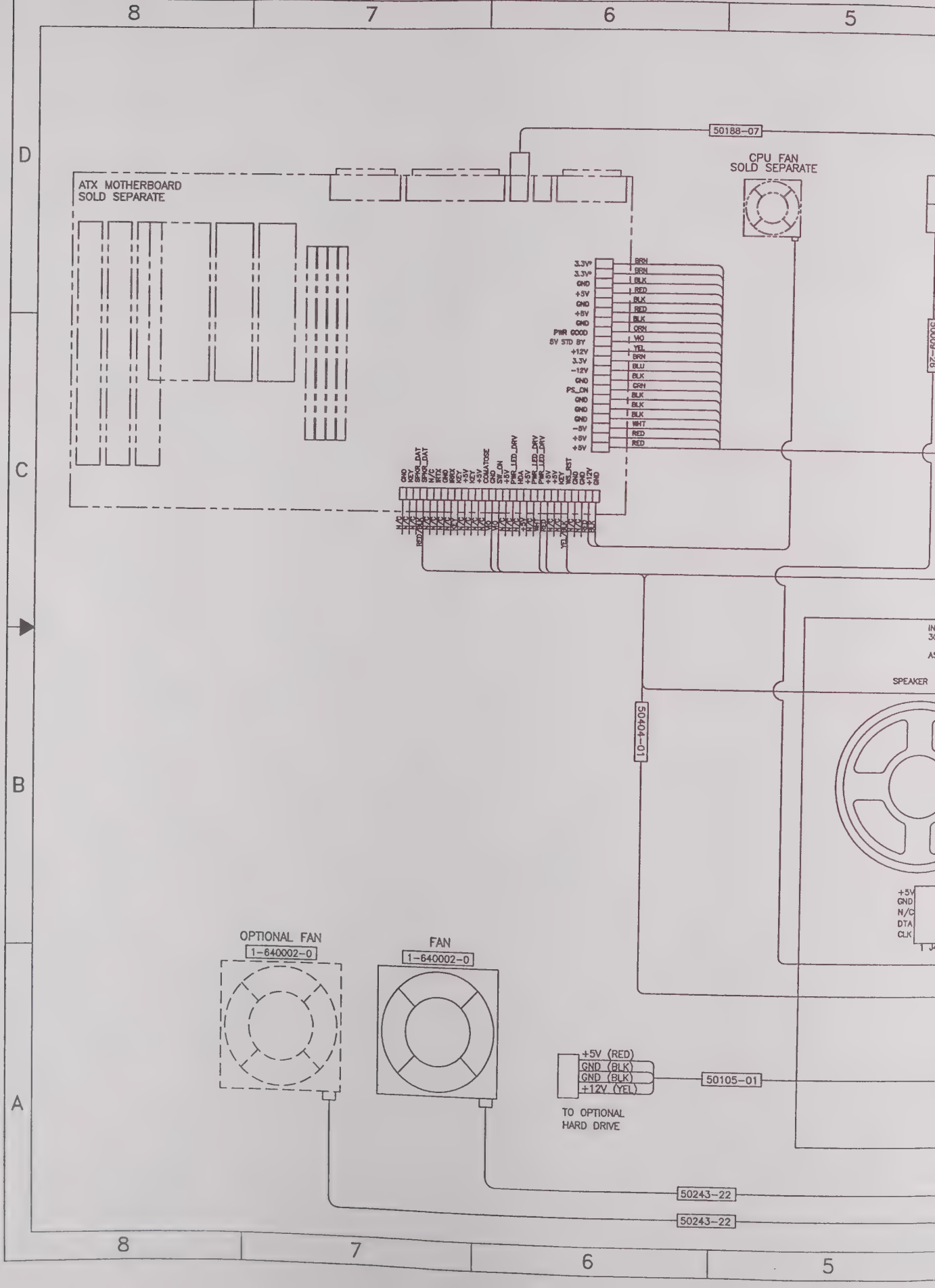
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SOLD SEPARATE
50188-07
CPU FAN
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3.3V BRN
GND BLK
+5V RED
GND BLK
+5V RED
GND BLK
PWR GOOD GRN
5V STD BY VIO
+12V YEL
3.3V BRN
-12V BLU
GND BLK
PS_ON GRN
GND BLK
GND BLK
-5V BLK
+5V WHT
+5V RED
50009-28
SPEAKER
50404-01
+5V
GND
N/C
DTA
CLK
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FAN
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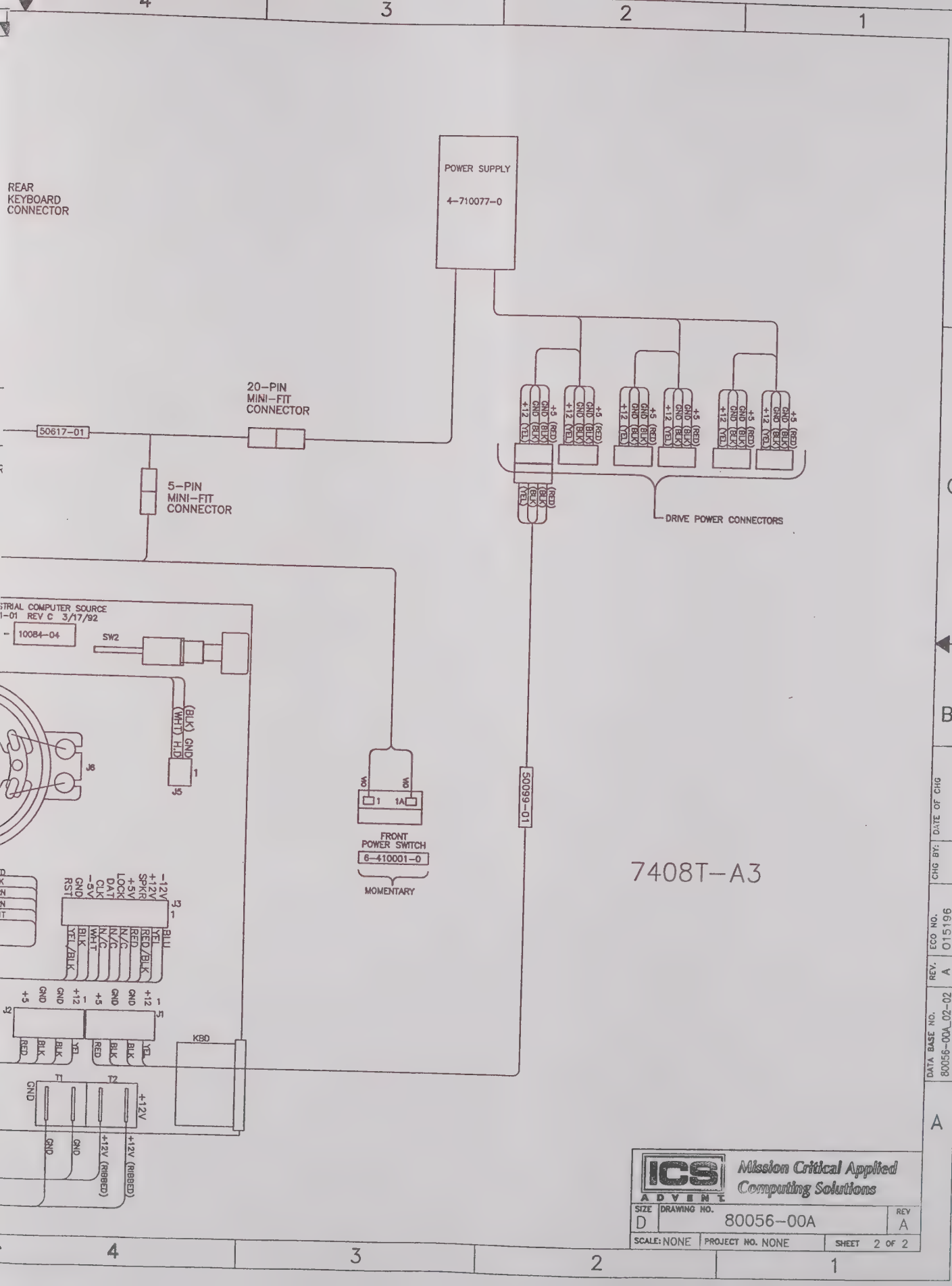

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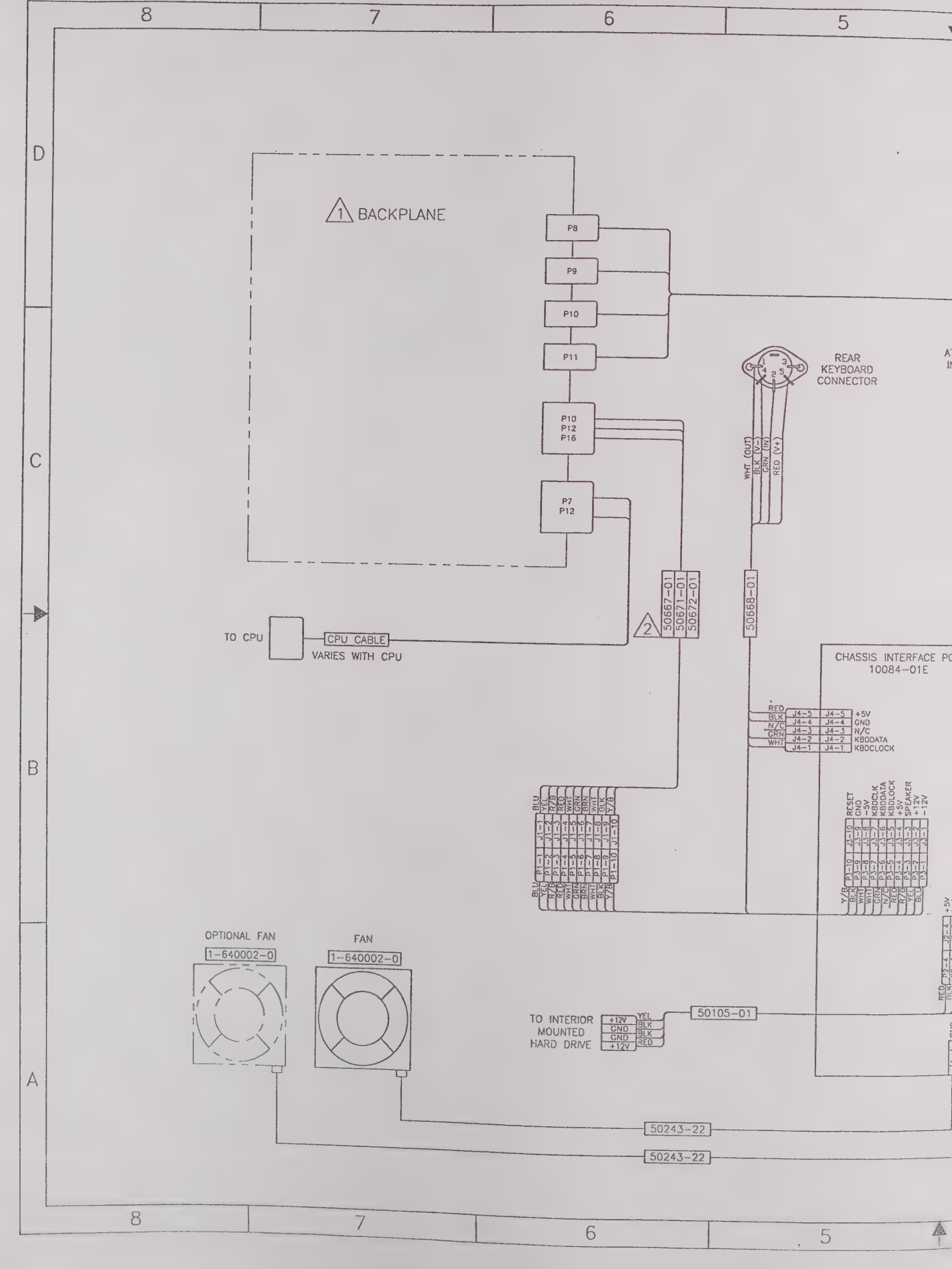
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P16
P7
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KEYBOARD
CONNECTOR
WHT (OUT)
BLK (V-)
GRN (IN)
RED (V+)
50667-01
50671-01
50672-01
50668-01
2
TO CPU
CPU CABLE
VARIES WITH CPU
CHASSIS INTERFACE PC
10084-01E
RED
BLK
N/C
GRN
WHT
J4-5
J4-4
J4-3
J4-2
J4-1
+5V
GND
N/C
KBDATA
KBDCLOCK
RESET
-5V
KBDCLK
KBDATA
KBDLOCK
+5V
SPEAKER
+12V
-12V
OPTIONAL FAN
1-640002-0
FAN
1-640002-0
TO INTERIOR
MOUNTED
HARD DRIVE
+12V
GND
GND
+12V
YEL
BLK
BLK
RED
50105-01
50243-22
50243-22

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POWER SUPPLY

4-700053-0(48VDC/300W)
4-710078-0(400W/5 OUT)
4-710095-0(300W/5 OUT)

CH TO CPU HD
CATOR OUTPUT

50669-01

DISK/HARD
DRIVE POWER

50099-01

CHASSIS GND

2 ADAPTER USED DEPENDS ON BACKPLANE BEING INSTALLED. SEE BACKPLANE BILL OF MATERIALS.

1 SEE SEPARATE BILL OF MATERIALS FOR SPECIFIC PART NUMBER.

THIS DRAWING IS REFERENCED BY MULTIPLE BILL OF MATERIALS.

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ENGINEER	
MFG ENG	
QUAL ENG	

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TITLE
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7415-A3/A4/D3

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Declaration of Conformity

(according to ISO/IEC Guide 22 and EN 45014)

6260 Sequence Drive
San Diego, CA 92121-4371
(800) 523-2320

declares that the following products and those on the next page:

7408-A3	**7408B-A3**	**7408T-A3**	**7408TB-A3**	**7408-D3**	**7408B-D3**
7415-A3	**7415B-A3**	**7415-A4**	**7415B-A4**	**7415-D3**	**7415B-D3**

to which this declaration relates, meets the essential health and safety requirements and is in conformity with the relevant EU Directives listed below:

EU EMC Directive 89/336/EEC
EU Low Voltage Directive 73/23/EEC

using the relevant section of the following EU standards and other normative documents:

EN 50081-1:1992 Emissions, Generic Requirements.
-EN 55022 Measurement of radio interference characteristics of information technology equipment.

EN 50082-1:1992 Immunity, Generic Requirements.
-IEC 1000-4-2:1995 Immunity for radiated electromagnetic fields.
(Supersedes IEC 801-2)
-IEC 1000-4-3:1995 Immunity for radiated RF electromagnetic fields.
(Supersedes IEC 801-3)
-IEC 1000-4-4:1995 Immunity for AC and I/O lines, fast transients common mode.
(Supersedes IEC 801-4)

EN 60950:1992 Safety of Information Technology Equipment.

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July 29, 1999
San Diego, CA

Information supporting this declaration is contained in the applicable Technical Construction file available from:

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